Meristic and Morphometric Data on the Flatfish *Citharichthys gilberti* from Panama

by

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Citharichthys gilberti Jenkins and Evermann, a common eastern Pacific flatfish, is known from Guaymas and Baja California, Mexico, south to Peru (Miller, 1966). It attains a total length of at least 260 mm (Meek and Hildebrand, 1928), frequently occurs on muddy bottoms and may enter rivers or other brackish water environments. Despite wide distribution there are apparently few literature references to the species and little is known of its life history or development. During a recent trip to the Pacific coast of Panama, *C. gilberti* was found to be the most abundant flatfish taken at a number of poisoned inshore and intertidal stations. Sufficient specimens were obtained over a broad size range, 18-193 mm SL, to permit the present report on meristic and morphometric characteristics of the isthmian population.

Counts and measurements made on undamaged freshly preserved material generally follow the methods of Norman (1934) with these exceptions or additions: standard length is measured from the anterior extremity to the rear of the hypural; pelvic fin length from the outer axillary angle to the tip of the longest ray; pectoral length from the upper (right) axillary angle to the tip of the longest ray; postorbital length from posterior margin of the right orbit to the extremity of the bony opercle; the last two dorsal and anal fin rays are counted separately. Vertebral counts are from radiographs.

Lateral line scales ranged from 41 to 45 and the count averaged 42.7 in 66 specimens. Data on other counts and measurements are shown in Tables 1 through 5.

With the exception of eye diameter, postorbital and maxillary lengths (Fig.1), proportional measurements generally indicate isometric growth over the present size range. Eye diameter is negatively allometric and ranges from over 27 per cent of head length at 20 mm SL to less than 15 per cent at 190 mm. Postorbital and maxillary lengths are positively allometric over the same size range.

Meek and Hildebrand *(op. cit.)* doubtfully referred two larvae, 25 and 40 mm TL, to *C. gilberti*. Present collections include fifteen specimens 18.2-31.8 mm SL (23.2-40.2 mm TL) wherein eye migration is complete and coloration and other characteristics agree with those

Table 1. Range, mean, standard deviation and standard error for 11 characters in *Citharichthys gilberti* (18.2-192.9 mm SL) shown in per cent of standard length or head length.

Character	N	Per Cent of Standard Length or Head Length			
		Range	Mean	ó	Sx
Caudal fin length	84	21.3-30.1	24.0	1.664	0.182
Body depth	87	39.3-50.7	45.0	2.814	0.302
Left pectoral fin length	86	11.3-16.6	13.7	1.067	0.115
Right pectoral fin length	83	8.5-14.1	10.8	1.058	0.116
Left pelvic fin length	83	7.7-12.3	10.0	0.771	0.085
Right pelvic fin length	80	8.5-14.3	11.2	1.144	0.128
Head length	87	26.0-32.1	28.3	1.470	0.158
Eye diameter*	87	14.0-28.6	20.5	3.841	0.412
Snout length*	86	18.4-23.6	20.8	1.330	0.143
Postorbital length*	86	56.1-69.1	63.9	2.574	0.278
Maxillary length*	81	36.5-43.4	39.9	1.552	0.172

*—In per cent of head length.

Table 2. Frequency distribution of dorsal and anal fin rays in *Citharichthys gilberti*. Mean of dorsals = 83.6; ó = 2.284; Sx = 0.275; mean of anals = 62.7; ó = 1.953; Sx = 0.235.

Anal Fin Rays	Dorsal Fin Rays											Totals
	79	80	81	82	83	84	85	86	87	88	89	
59	1	1										2
60		3	1	1	1							6
61		3	5		4	1						13
62			1	3	6	3		1				14
63				1	2	2	4					9
64						4	4	3	1			12
65							2	1	1			4
66							1	3	2	1	1	8
67										1		1
Totals	1	7	7	5	13	10	11	8	4	2	1	69

Table 3. Frequency distribution of right and left pectoral fin rays in *Citharichthys gilberti.*

Right Pectoral Rays	Left Pectoral Rays					Totals
	8	9	10	11	12	
8				1		1
9			31	6		37
10		1	2	26	1	30
Totals		1	33	33	1	68

Table 4. Frequency distribution of gill rakers on the upper and lower limbs of the first gill arch in *Citharichthys gilberti.*

Upper Arch	Lower Arch					Totals
	12	13	14	15	16	
3	1					1
4	1	14	7	4		26
5	2	11	14	2	1	30
6						
Totals	4	25	21	6	1	57

Table 5. Frequency distribution of precaudal and caudal vertebrae in *Citharichthys gilberti.*

Precaudal Vertebrae	Caudal Vertebrae			Totals
	23	24	25	
9			3	3
10	3	63	4	70
11		1		1
Totals	3	64	7	74

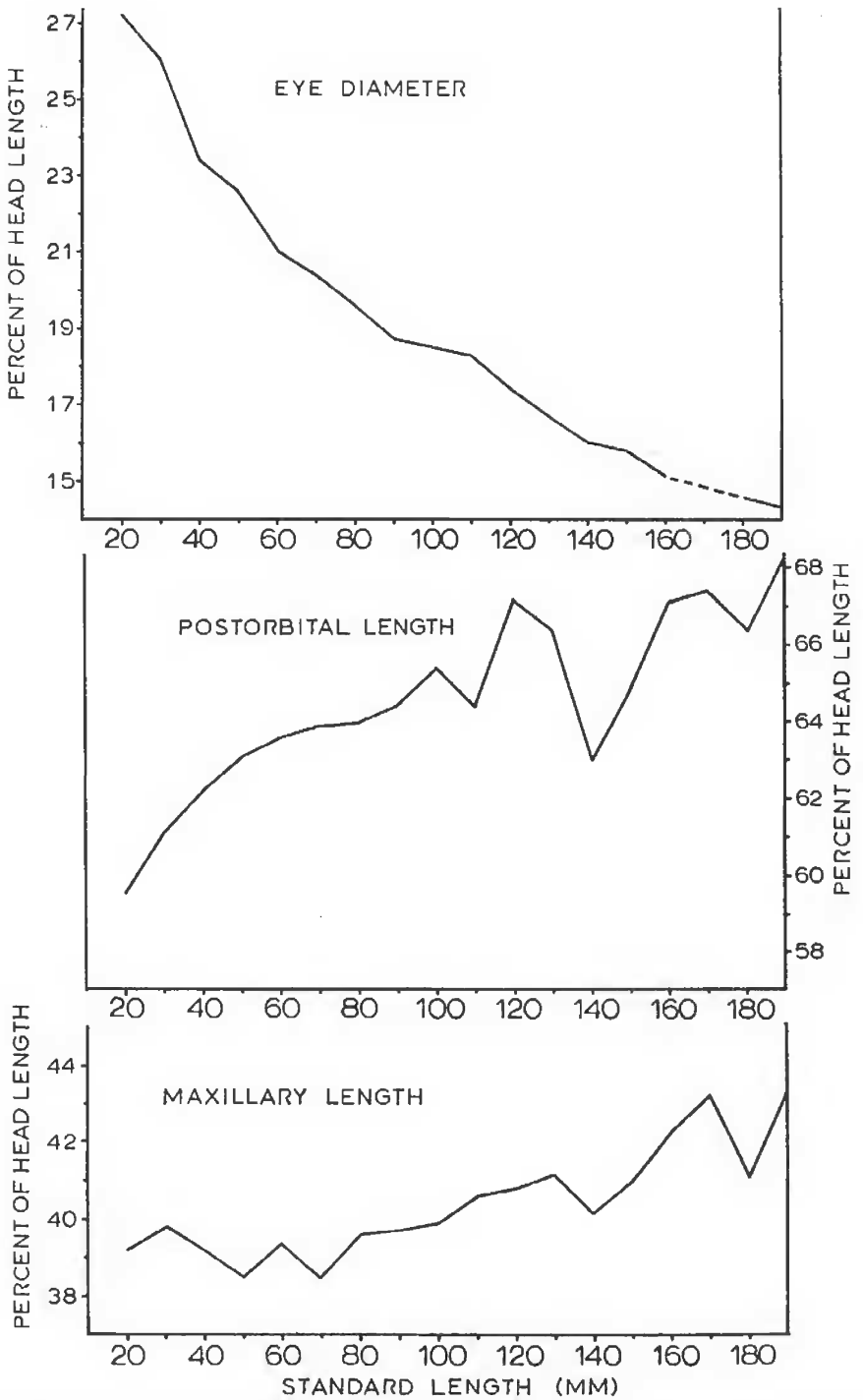

Figure 1. Proportional measurements of three characters in *Citharichthys gilberti* shown in per cent of head length. Data have been averaged for 10 mm SL intervals.

of the adult. It would appear that larval specimens of Meek and Hildebrand represent some flatfish other than *C. gilberti*.

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